Mrs. Graf

Monthly News Letter

Bureau of Agricultural Engineering

U. S. DEPARTMENT OF AGRICULTURE

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Lewis A. Jones spent May 9 to 14 in the Delta Section of Mississippi conferring with organized drainage district officials and others interested in a unified plan of drainage for this section of Mississippi. The Mississippi State Planning Commission, recently has given attention to organization procedures and possible plans for a study of the drainage problems in the Yazoo-Mississippi Delta.

On his return trip to Washington Mr. Jones spent May 15 to 18 reviewing the work of the CCC drainage camps in southeastern Missouri.

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R. D. Marsden left Washington May 5 to spend several weeks at the Hydraulic Laboratory, University of Iowa, analyzing research investigations and experimental work on the hydraulic jump on sloping aprons and run-off studies of the Ralston Creek watershed. The extensive run-off data compiled from the Ralston Creek watershed studies cover a continuous period of many years and a comprehensive analysis of the work is to be made. A report on estimating runoff under varying conditions will be made available upon final compilation of the data thus far collected on this watershed.

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J. C. Cotton visited the 5 CCC drainage camps in Delaware and Maryland on May 3 to 7 to inspect the research investigations on the flow of water in drainage channels. Several slope courses were established during 1936 to determine the value of the coefficient "n" in Kutter's and Manning's formulas for the flow of water in open channels under different conditions of ditch maintenance. The data obtained by field measurements are being analyzed in the Washington office.

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F. E. Staebner and J. R. Cowand returned to Washington May 6 from Willard, North Carolina where studies are being made to determine the value of supplemental irrigation in growing strawberries. The data collected during the 1938 season is now being analyzed.

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Demonstrations of ditch excavation by blasting were held in counties of central and northeastern Indiana during the past month. These demonstrations, arranged locally by county agents, were conducted under the supervision of D. H. Harker, Collaborator for the Indiana Drainage Camps and Purdue University Extension Service.

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During the the past month inspections of the Indiana and Ohio drainage camps were made by John G. Sutton, accompanied by Inspectors H.G. Edwards and F. F. Shafer, in the respective states. Mr. Sutton recently conferred

with Mr. Jones in the Washington office.

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During April, the Central District Drainage Camps report the following work accomplishments: 4,836,736 square yards of clearing; 1,119,448 cubic yards of excavation and embankment; 28,181 lineal feet of tile reconditioning; and 14,370 man-days of miscellaneous work. The local drainage enterprises cooperated to the extent of $65,937.00.

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At the request of Dr. G. E. P. Smith, chairman of a committee of nine appointed by the Governor of Arizona to study the situation as to underground waters in Arizona and their legal control, Wells A. Hutchins met with the committee at Phoenix at their first session. A possible outcome of the committee's work is recommended legislation to cope with what all agree is a difficult situation in that State, resulting from court decisions on ground waters.

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Leslie Bowen made a trip to the Pineridge Indian Reservation in western South Dakota, upon request of representatives of the U. S. Indian Service, and gave a talk on the fundamentals of irrigation to a convention of the teachers and project leaders at the reservation. It is planned to encourage the Indian population in the growing of subsistence gardens under irrigation. Most of the garden tracts are in the narrow valleys along the streams, and from the streams the water is to be taken either by gravity or by pumping. Small earth dams, some of which have already been constructed, are to provide storage wherever possible.

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Fred C. Scobey completed the manuscript for a technical bulletin on "The Flow of Water in Irrigation and Similar Canals", which will supersede Department Bulletin 194 "The Flow of Water in Irrigation Channels." In the new bulletin, all observations on the flow in flumes will be omitted as these data from Bulletin 194 were included with much similar data in Technical Bulletin 393 "The Flow of Water in Flumes". New material includes many tests on canals with shot-concrete linings, carrying both clear and muddy waters, the linings including those without smoothing treatment and those with various types of surface treatment that increase the capacity from 14 to 25 percent.

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A. A. Young investigated the possibilities of carrying on studies of evaporation from pans in comparison with actual lake losses at two widely separated points in southern California - Lake Elsinore in the Santa Ana Mountains and Silver Lake in the Mojave Desert, both of which offer unusual opportunities to check reduction coefficients for the Weather Bureau pan and the new screen-covered pan. Each lake is 6 to 7 miles long and about 2 miles wide, and apparently evaporation is the only means of lowering the water surface of each. The Silver Lake area is ordinarily entirely dry but owing to unusually heavy rains in March, the Mojave River, which normally sinks into the desert sands in the vicinity of Barstow, extended itself an additional 50 miles to end in the desert depression called Silver Lake, which now has neither inflow nor outflow. Test pits in the lake bottom when it was dry showed silt

deposits in excess of 3 feet, which would prevent any considerable amount of seepage. The water is not over 7 feet deep at the lowest point, and will probably dry up in 12 to 16 months. Lake Elsinore has a small inflow from the San Jacinto River, which is measured by the Geological Survey at a gaging station above the mouth of the river. The inflow is sufficient to maintain the lake for some time.

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R. L. Parshall and Carl Rohwer built and tested the model of an instrument to measure small differences in head by taking advantage of the fact that for low heads of the order of 0.001 foot the resulting velocity is several hundred times greater numerically than the head that produces it. The preliminary tests of this device indicate that it will be possible to measure small heads in this way.

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Under the snow survey and irrigation water supply forecasting project, J. C. Marr, R. A. Work, and L. T. Jessup prepared and distributed reports of monthly observations on the Columbia River Basin in Idaho, Oregon, and Washington; R. L. Parshall and Carl Rohwer for the Rio Grande, Colorado, and Missouri and Arkansas River basins; and George D. Clyde for the Utah area. Several conferences were held to plan for the forecast of water supply conditions for the coming irrigation season. R. L. Parshall reports that a series of four monthly pictures of a section of the back range of mountains at the head of the Poudre River is now available for a preliminary study of the correlation of snow cover as indicated by these pictures and the stream flow from that area. This study will be developed along the lines worked out by H. L. Potts, Engineer of the Denver Municipal Water Board.

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A. T. Mitchelson and Dean C. Muckel inspected damage done to water-spreading areas in southern California by the floods of early March. Estimates were made of equipment needed to replace Parshall flumes, recorders, etc. that had been used on the Bureau's experimental plots and that had been lost or damaged during the floods. Messrs. Mitchelson, Muckel and Harry F. Blaney also inspected irrigation work in Coachella, Palo Verde, and Imperial valleys, and spreading systems on Whitewater and Santa Ana rivers.

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W. P. Green has completed a series of calorimeter tests on various fruits and vegetables at Arlington Farm. The tests have included runs at 45° and 65° F. At these temperatures the results show that the amount of heat generated by respiration of these products can be estimated with reasonable accuracy from the amount of CO_2 generated.

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In cooperation with the Bureau of Home Economics and the Illuminating Engineering Society, a Farmers' Bulletin on farm lighting is being prepared. A meeting of those who will contribute to the publication was held in Washington. Representatives of the Tennessee Valley Authority, Illuminating Engineering Society, American Public Health Association , Case School of Applied Science, Rural Electrification Association, and the United States Department of Agriculture participated in this meeting.

A. H. Senner has been working on air atomizing oil burners for orchard heating. Several heaters have been constructed and two are being shipped to California for further testing.

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A wheat drier embodying the principle of first heating the wheat then blowing air through it has been constructed by C. F. Kelly. The drier is being tested at Arlington Farm.

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Two 3-room experimental houses have been erected in the test house group at Athens, Georgia, to measure the results of changing various details of construction one at a time. There are six one-room houses of various types of construction also under study.

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This Bureau was fortunate enough to win three awards in the 1938 Annual Exhibition of the Association of Federal Architects. This exhibition which is held in the foyer of the National Museum during the month of May includes both the work of the various Departments and personal work submitted by individuals employed in the Government service. Awards are given for Departmental work and for various classes of personal work. J. R. Dodge received a First Award for a water color drawing and J. E. Corey a Third Award for a water color, both in the class for personal work. The cover design which will be used on the Plan Book for Western States received a First Award for Departmental work.

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G. A. Cumings left Washington May 11 on an inspection trip in connection with the spring fertilizer placement and machinery studies in the Southeastern States. His itinerary included Virginia, North and South Carolina, and Georgia. He returned to Washington the latter part of the month.

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L. G. Schoenleber completed the spring fertilizer placement work in the Middle Western States with two sugar beet experiments in Michigan the first week of May. He later went to Oxford, North Carolina to begin the experiments with tobacco and to Geneva, New York, in connection with the fertilizer studies with tomatoes and beans.

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W. H. Redit returned to Washington May 2 after having completed the fertilizer work in the Southeastern States. Later he went to the Eastern Shore section where fertilizer experiments with tomatoes and sweet potatoes were conducted at Onley, Virginia, Salisbury and Ridgely, Maryland, and Bethel, Delaware. D. B. Eldredge assisted Mr. Redit in the Eastern Shore work.

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W. R. Humphries started the fertilizer experiments with cannery peas at Geneva, New York, the latter part of April.

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Germination stand counts are being made on sugar beet plantings put in with the experimental single seed ball planter built at Davis, Calif., and with single seed planters being developed by John Deere and

the Ventura Manufacturing Company. Because of the lateness of the planting season in California and the consequent limited moisture, germination stands are spotted and some of the fields will not be satisfactory for mechanical blocking. However, mechanically blocked plots are included on some of the single seed plantings.

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Announcement has been made of a donation of $70,000 by the United States Beet Sugar Association to the University of California for use on the cooperative sugar beet production machinery project of the University's Division of Agricultural Engineering and this Bureau. The funds are for use over a three-year period, $30,000 being available for the first year and $20,000 a year for the second and third years. An additional $15,000 is also being set aside by the Association for the three-year period to be used elsewhere as the Association's advisory committee decides. It was felt by the investigating committee of the Association that harvesting will be the major problem and, because of the long harvest season in California and the excellent research facilities there, the major portion of the funds were allocated to the University of California.

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E. D. Gordon reports that one series of tests has been completed in which a conventional type of disk harrow having two opposed sets of disks of four each was used. The disk unit floats so that it is necessary to measure the average penetration. The longitudinal and vertical components of draft are also measured. The imposed factors are angle, speed, weight on the disk and the moisture and apparent specific gravity of the soil. For this particular disk which was an 18-inch disk spaced 6-5/8 inches, the factor of disk angle setting appeared to have the greatest direct influence on penetration. For a given angle the factor of speed has an inverse effect on penetration. This is a part of a study of the draft requirements of tillage tools. Tests are at present under way on the notched disk, using the same arrangement as above. It is contemplated that other disks having different spacings and depth of cut will be tested.

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I. F. Reed reports the data obtained at the Farm Tillage Machinery Laboratory for plow reactions plotted against speed fit parabolic curves very closely. Studying the curves produced shows a very high correlation between the values for the constants a, b and c and the soil conditions as measured by the apparent specific gravity and moisture content of the soil in the immediate area of the cutting edge of the share in parabolic equations of best fit. Studies are now under way to determine and measure the effects of changing the angle between the moldboard and landside for two shapes of bottoms.

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Manufacturers of plows and other tillage tools are very much interested in the results being obtained at the Farm Tillage Machinery Laboratory at Auburn, Alabama. One company is building a bottom based on their experience and the results of tests made at the laboratory and

are planning to send this new bottom to the laboratory for test as soon as it is completed. Several other companies have requested information on special bottoms or are making arrangements to make cooperative tests on their equipment.

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Frank C. Taylor, who has had charge of the Accounts Office of the Bureau almost from its beginning, has recently accepted a similar position in the Bureau of Animal Industry. His successor is Henry M. Johns who has been with the Bureau for several years.

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